CLAIMS

1 An annealing apparatus adapted for annealing magnetic layers of a magneto optical recording medium,

the annealing apparatus comprising:

a light source for emitting light beams having a predetermined wavelength;

diffraction optical means for optically separating light beams emitted from the light source into first light beams which are the 0 (zero)-th order diffracted light beams and second and third light beams which are the first order diffracted light beams, wherein in the case where each of beam outputs of the second and third light beams is caused to be a beam output necessary in annealing the magnetic layers, the diffraction optical means serves to adjust light quantity ratio between the first light beams and the second and third light beams so that a beam output of the first light beams is equal to the beam output necessary in performing anneal processing or less to optically separate the light beams thus obtained;

irradiation means for converging the first light beams which have been optically separated at the diffraction optical means to irradiate the first light beams thus converged onto the magnetic layers of guide grooves or land portions forming both sides of the guide grooves which have been formed at the magneto optical recording medium, and for converging the second and

third light beams to irradiate the second and third light beams which have been thus converged onto the magnetic layers in the vicinity of the boundary portions between the guide groove and the land portion;

first intensity distribution detecting means for detecting intensity distribution of light quantities of rays of return light of the first light beams which have been irradiated onto the magnetic layers of the guide grooves;

first tracking error signal generating means for generating a first tracking error signal on the basis of the intensity distribution of light quantities of rays of return light of the first light beams detected by the first intensity distribution detecting means; and

control means for controlling the irradiation means on the basis of linear characteristic of the first tracking error signal generated by the first tracking error signal generating means in such a manner that the first light beams follow the guide grooves or the land portions.

2 The annealing apparatus as set forth in claim 1,

wherein beam diameter of the first light beams optically separated at the diffraction optical means is such a size to maintain linearity of a tracking error signal generated by the tracking error signal generating means.

3 The annealing apparatus as set forth in claim 2,

wherein each of beam diameters of the second and third light beams is smaller than beam diameter of the first light beams.

4 The annealing apparatus as set forth in claim 1, further comprising:

second intensity distribution detecting means for respectively detecting intensity distributions of light quantities of rays of return light of the second and third light beams.

5 The annealing apparatus as set forth in claim 4, further comprising:

second tracking error signal generating means for generating a second tracking error signal and a third tracking error signal on the basis of intensity distributions of light quantities of rays of the second and third light beams which have been detected by the second intensity distribution detecting means.

6 The annealing apparatus as set forth in claim 5, further comprising:

rotation means for rotating the diffraction optical means with optical axis of the light beams emitted from the light source to the diffraction optical means being as center of rotation.

7 The annealing apparatus as set forth in claim 1, comprising:

irradiation position determination means for determining irradiation positions onto the magneto optical recording medium of the second and third light beams when the irradiation means follows the guide grooves or the land portions in accordance with control by control means based on linear characteristic of the first tracking error signal by making reference to respective maximum and minimum values of the second and third tracking

error signals changed by an angle when the diffraction optical means is rotated by the rotation means.

8 An annealing method of annealing magnetic layers of a magneto optical recording medium,

the annealing method comprising:

optically separating light beams emitted from a light source into first light beams which are the 0 (zero)-th order diffracted light beams and second and third light beams which are the first order diffracted light beams to allow the light beams thus optically separated to be incident on irradiation means;

allowing the irradiation means to converge the first light beams thus optically separated to irradiate the first light beams thus converged onto the magnetic layers of guide grooves or land portions forming both sides of the guide grooves which have been formed at the magneto optical recording medium;

allowing the irradiation means to converge the second and third light beams which have been optically separated to irradiate the second and third light beams thus converged onto the magnetic layers in the vicinity of the boundary portions between the guide grooves and the land portions;

detecting intensity distribution of light quantities of rays of return light of the first light beams irradiated onto the magnetic layers of the guide grooves;

generating a first tracking error signal on the basis of the intensity distribution of light quantities of rays of return light of the first light beams thus detected; and

controlling the irradiation means on the basis of linear characteristic of the generated first tracking error signal in such a manner that the first light beams follow the guide grooves or the land portions.

9 The annealing method as set forth in claim 8,

wherein beam diameter of the optically separated first light beams is such a size to maintain linearity of the tracking error signal.

10 The annealing method as set forth in claim 9,

wherein each of beam diameters of the second and third light beams is smaller than beam diameter of the first light beams.

11 The annealing method as set forth in claim 8, further comprising:

detecting intensity distribution of light quantities of rays of return light of the second and third light beams.

12 The annealing method as set forth in claim 11, further comprising:

generating a second tracking error signal and a third tracking error signal on the basis of intensity distributions of light quantities of rays of return light of the second and third light beams.

13 The annealing method as set forth in claim 12,

wherein the light beams which are emitted from the light source and

are optically separated and emitted of the first, second and third light beams are rotated with the optical axis thereof being as center of rotation.

14 The annealing method as set forth in claim 13, comprising:

determining irradiation positions onto the magneto optical recording medium of the second and third light beams when the irradiation means follows the guide grooves or the land portions in accordance with control based on linear characteristic of the first tracking error signal by making reference to respective maximum and minimum values of the second and third tracking error signals changed in accordance with an angle when diffraction optical means is rotated by rotation of the light beams.